

## ORIGINAL RESEARCH

# Demographics and Histopathological Patterns of Oral Squamous Cell Carcinoma at a Tertiary Level Referral Hospital in Hyderabad, India: A 5-Year Retrospective Study

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## ABSTRACT

**Background:** To study the demographics and histopathological patterns of oral squamous cell carcinoma (OSCC) reported at a tertiary level referral teaching hospital in Hyderabad, India.

**Materials and methods:** An institutional retrospective study of biopsies sent to a tertiary level referral teaching hospital, Hyderabad. The data was collected year-wise for a period of 5 years from 2007 to 2011 with reference to age, sex, site involved and final diagnosis based on the histopathological findings.

**Results:** A total of 1,005 oral biopsies were reviewed. Of these, OSCC was seen in 234 cases (23.28%). Buccal mucosa (47.7%) was the most frequently involved site followed by tongue (27.6%). Most of the OSCC patients were in the age group of 41 to 50 years, males and histopathologically well-differentiated (62%).

**Conclusion:** This study showed that OSCC is widespread in the patients of this region.

**Keywords:** Squamous cell carcinoma, Tobacco, Oral cancer, Buccal mucosa, Tongue.

**How to cite this article:** Kiran G, Shyam NDVN, Rao J, Krishna A, Reddy BS, Prasad N. Demographics and Histopathological Patterns of Oral Squamous Cell Carcinoma at a Tertiary Level Referral Hospital in Hyderabad, India: A 5-Year Retrospective Study. *J Orofac Res* 2012;2(4):198-201.

**Source of support:** Nil

**Conflict of interest:** None declared

## INTRODUCTION

Globally, oral cancer is the sixth most common cancer with an incidence of more than 300,000 cases yearly, of which 62% occur in developing countries.<sup>1</sup> In India it is the most common cancer in men and third most common cancer in women, with incidence rates per 100,000 people as 12.8 and 7.5 in men and women respectively.<sup>2,3</sup> The main risk factors are tobacco in the form of chewing and smoking and alcohol consumption.<sup>4,5</sup>

Oral squamous cell carcinoma (OSCC) normally occurs in the elderly men during the fifth to eighth decades of life and is rarely seen in young people. However, recently the incidence of oral cancer in younger age group is increasing due to easy availability of gutkas and pan masalas which are packed appealingly to the present generation.<sup>6,7</sup> Various classification systems have been proposed to categorize OSCC and the treatment planning is based on them. Treatment is usually in the form of surgery, chemotherapy and radiotherapy. Prognosis of oral cancer differs significantly

with respect to age, sex, site and histopathological grading. Younger individuals, histopathologically well-differentiated lesions and lesions involving lips generally have a much better prognosis than that of older individuals, poorly differentiated lesions and lesions involving tongue or floor of mouth respectively. But the prognosis of oral cancer is generally poor, with a 5-year survival rate of less than 50%.<sup>7</sup>

However, the spectrum of oral malignancy varies from place to place within a country. The prevalence rate of oral cancer is high in Hyderabad, the capital city of Andhra Pradesh and patients from surrounding areas come here to the tertiary level referral hospital. This study was planned to study the demographics and histopathologic patterns of OSCC.

## MATERIALS AND METHODS

This is an institutional retrospective study from 2007 to 2011. Data was collected year-wise in the context of age, sex, site involved and final diagnosis given based on histopathological features. Patient records maintained in the Department of General Pathology were retrieved manually.

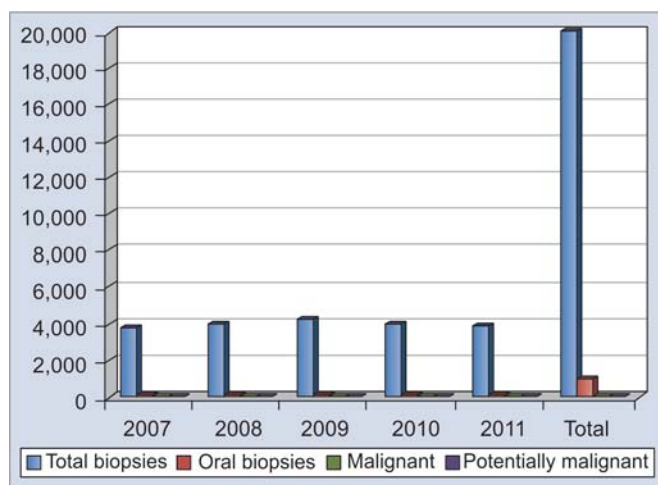
## RESULTS

A total of 19,988 biopsies were reported in this institute during the study period from 2007 to 2011. Of these biopsies, 1,005 (5%) were from the oral region. Of the oral biopsies, 123 (12.23%) patients were reported to be potentially malignant, 293 (29.15%) were malignant and 589 (58.6%) were other benign lesions. The year-wise trends of prevalence of malignant tumors revealed that the maximum number were in 2009 with 78 biopsies, followed by 70 biopsies during 2011 (Table 1 and Graph 1). Out of 293 malignant cases, 234 cases (79.86%) were diagnosed as OSCC, of which 182 (62%) had well-differentiated carcinoma, 42 (14%) had moderately differentiated carcinoma and 10 (3.4%) had poorly differentiated carcinoma (Table 2, Graph 2, Figs 1 and 2).

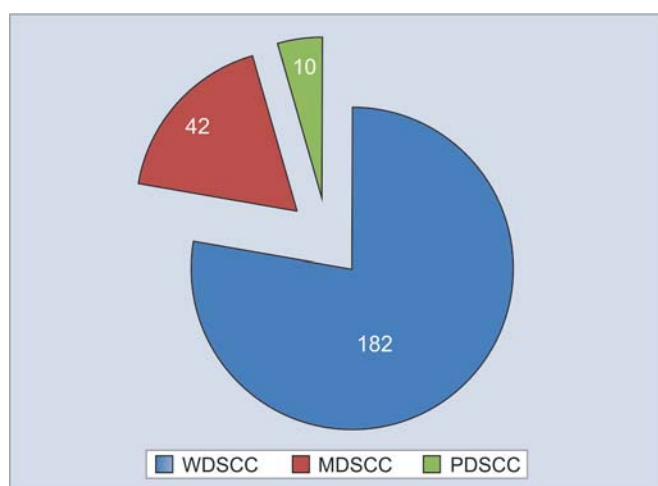
According to the age-wise distribution, majority of the patients were reported in the age group of 41 to 50 years (Table 3 and Graph 3). On the basis of the site of involvement, the buccal mucosa (47.7%) was most frequently involved followed by tongue (27.6%).

**Table 1:** Number of biopsies reported yearly

Year	Total biopsies	Oral biopsies	Potentially malignant lesions	Malignant lesions	IR/1000
2007	3,804	147	9	45	2.36
2008	4,001	131	7	41	1.75
2009	4,260	233	31	78	7.28
2010	4,032	238	22	59	5.46
2011	3,891	256	54	70	13.88
Total	19,988	1,005	123	293	6.15

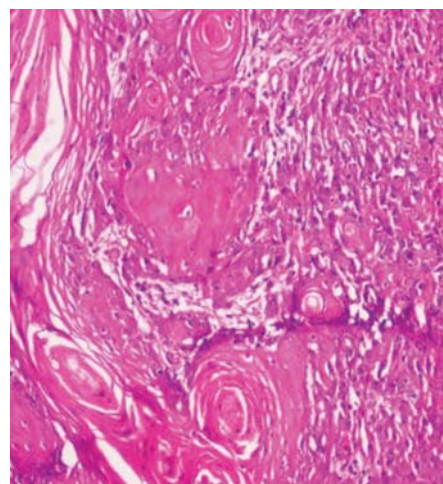
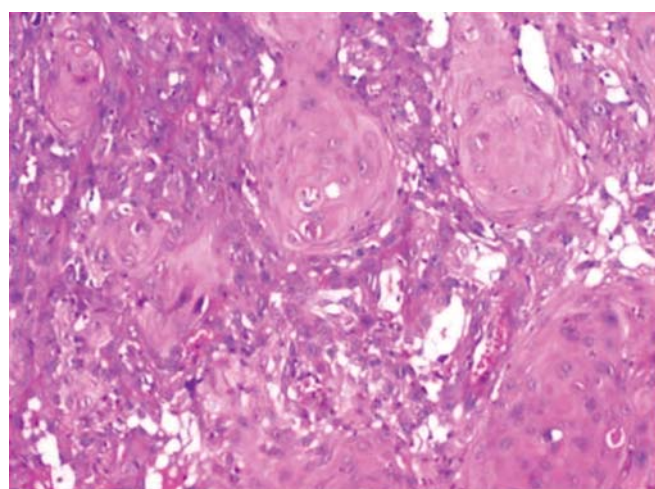
**Graph 1:** Number of biopsies reported yearly**Table 2:** Distribution of cases according to histopathological diagnosis

Category	Number of cases	Percentage
WDSCC	182	77.77
MDSCC	42	17.94
PDSCC	10	4.27
Total (SCC)	234	100

**Graph 2:** Distribution of cases according to histopathological diagnosis

## DISCUSSION

Oral cancer is the cancer of the oral mucosa and lip (excluding the skin). Consumption of tobacco as smoking

**Fig. 1:** Photomicrograph of well-differentiated squamous cell carcinoma**Fig. 2:** Photomicrograph of moderately differentiated squamous cell carcinoma

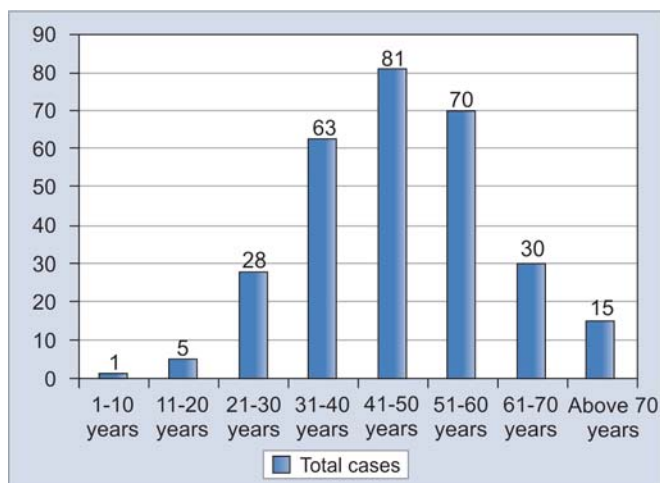
of bidis and cigarettes or as smokeless forms like tobacco chewing or mishri (tobacco used as tooth cleanser) is the main etiological agent of oral cancer.<sup>8</sup> Studies have shown that the usage of tobacco in various forms is mounting at the rate of 2 to 3% yearly, and it is expected to cause about 13% of deaths in India by 2020.<sup>9</sup>

Oral cavity has rich blood supply and lymphatic drainage, therefore the likelihood of cervical metastases of OSCC is very high making it a life-threatening disease.<sup>10</sup> Hence, early diagnosis and treatment is necessary in oral cancer as studies have shown that a cure rate of over 90% can be achieved in early stages.<sup>11</sup> The various factors that resulted in increased incidence of oral cancer in Indians are urbanization, changes in lifestyles, increased population and increased lifespan of individuals.<sup>12</sup>

Several epidemiological studies have been carried out in the past in relation to oral malignancies in India. Mehta et al (1969) showed that highest number of oral cancer cases in Kerala and Andhra Pradesh. According to them, increased consumption of tobacco in various forms, specially reverse

**Table 3:** Distribution of cases according to age

Age group (years)	Total cases
1-10	01
11-20	05
21-30	28
31-40	63
41-50	81
51-60	70
61-70	30
>70	15

**Graph 3:** Distribution of cases according to age

smoking being more prevalent in certain areas in this region might result in more number of cases.<sup>13</sup>

In our study, 1,005 oral biopsies were recorded in this institute from 2007 and 2012. Out of which, 234 (23.28%) were diagnosed as OSCC. This shows the high prevalence of OSCC in this region. Our finding was in accordance to that of Agrawal and Rajderkar (2012) and Padmakumary, Varghese (2000) who also found that majority of oral malignant lesions in their study groups to be OSCC.<sup>14,15</sup>

There was a male preponderance in our study with the male to female ratio of 1.4:1. This might be due to the high consumption of tobacco and alcohol by males and generally in India, when compared to men, females are less indulged in these habits. Our findings are similar to that of Iype et al (2001) who reported 2.3:1 ratio and Agrawal and Rajderkar (2012) who reported 3.57:1.<sup>7,14</sup>

Majority of the OSCC patients were in the age group of 41 to 50 years. However, Gangane et al (2007) and Saraswathi et al (2006) reported majority of oral malignancies in the 50 to 59 years age group and 40 to 61 years age group respectively.<sup>6,16</sup> Thus, proving OSCC to be common in older adults.

In this study, year-wise trends of prevalence of oral malignancies revealed that maximum number of cases were reported in the year 2009 followed by 2011. However, Mehrotra et al (2003) after analyzing their results from 2003 to 2007, did not detect any clear cut trends in prevalence, although they found that number of cases gradually

increased year wise. According to them this could reflect increasing usage of chewing gutka and pan masala.<sup>17</sup> In our study the incidence of more malignant tumors in 2009 is difficult to explain, this might be due to the induction of enthusiastic oral surgeons in the hospital or may be due to increased awareness about oral cancer among general population of this area.

Various classification systems have been used for staging and grading OSCC, like Broder's (1920) classification, TNM staging system and the recent AJCC TNM system. We followed Broder's histopathological classification in which tumors were graded on the basis of degree of differentiation and keratinization of tumor cells into four grades: Grade I: Well-differentiated tumors in which 75 to 100% of cells are differentiated, grade II: Moderately differentiated tumors in which 50 to 75% of cells are differentiated, grade III: Poorly differentiated tumors in which 25 to 50% of cells are differentiated and grade IV: Anaplastic tumor in which 0 to 25% of cells are differentiated. It is noted that the degree of keratinization decreases from grades I to IV, whereas the number of mitotic figures increase from grades I to IV.<sup>18</sup>

Out of 234 cases of OSCC, well-differentiated carcinoma constituted 182 (62.1%), while moderately differentiated carcinoma constituted 42 (14.3%) and 10 (34.1%) were poorly differentiated carcinoma. The more proportion of cases being well-differentiated might be due to increasing awareness of oral cancer among people of this region coupled with cancer awareness programs by the government. Our findings were similar to that of Iype et al (2001) who reported that 52.6% of their patients had well-differentiated tumors. However, Ayaz (2011) reported that majority of OSCC in their study were moderately differentiated.<sup>7,19</sup>

On the basis of site of involvement, buccal mucosa (47.7%) was found to be most frequently involved site followed by tongue (27.6%). This might be due to increasing usage of smokeless tobacco in this region. Here people have a habit of placing tobacco in the form of gutka in the buccal mucosa for longer periods of time. Bhurgri (2005) also reported that the buccal mucosa was the most frequently involved site (55.9%), followed by tongue (28.4%).<sup>20</sup> However, Agrawal and Rajderkar (2012) reported that tongue was the most common site followed by buccal mucosa.<sup>14</sup>

Prevalence of oral cancer in general should be less when compared to other cancers as oral cavity is easily accessible for examination. But either due to ignorance or inaccessibility of proper medical care, the disease usually gets detected in later stages, thus increasing its mortality rate. Hence, the use of screening and detection aids and the development of molecular markers may improve the early diagnosis of this dreadful disease and may help in reducing



its mortality rate. Emergence of new treatment modalities like tumor-specific antibodies and gene therapy are giving more hope for oral cancer patients. Governments should take appropriate prevention and cessation strategies regarding risk factors like smoking and smokeless tobacco products in various forms. Study of prevalence patterns from different parts of India may help in devising specific strategies for reducing the risk of oral cancer.

### Limitations of Study

Data obtained and interpreted from a single institution has obvious limitations. The data reflects the specific patient population reporting to this hospital and not the community as a whole. Further such studies for longer time periods at different levels of referral centers may help us in identifying the prevalence patterns of this alarming disease, so that prevention activities can be carried out in order to decrease the incidence and mortality rates due to oral cancers.

### CONCLUSION

Data of oral biopsies sent to a tertiary level referral hospital in Hyderabad, Andhra Pradesh from 2007 to 2011 were collected and interpreted. OSCC was most common of oral malignancies, of which most were in the age group of 41 to 50 years, males, and histopathologically well differentiated.

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